Name:

at1121exam_practice: Radicals and Squares (v613)

Question 1

Simplify the radical expressions.

$\sqrt{50}$ $\sqrt{44}$ $\sqrt{63}$

$\sqrt{5 \cdot 5 \cdot 2}$ $\sqrt{2 \cdot 2 \cdot 11}$ $\sqrt{3 \cdot 3 \cdot 7}$

$5\sqrt{2}$ $2\sqrt{11}$ $3\sqrt{7}$

Question 2

Find all solutions to the equation below:

$$2(x-4)^2 + 8 \;=\; 80$$

First, subtract 8 from both sides.

$$2(x-4)^2 = 72$$

Then, divide both sides by 2.

$$(x-4)^2 = 36$$

Undo the squaring. Remember the plus-minus symbol.

$$x - 4 = \pm 6$$

Add 4 to both sides.

$$x = 4 \pm 6$$

So the two solutions are $x = 10$ and $x = -2$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 + 10x = 56$$

$$x^2 + 10x + 25 = 56 + 25$$
$$x^2 + 10x + 25 = 81$$
$$(x+5)^2 = 81$$
$$x + 5 = \pm 9$$
$$x = -5 \pm 9$$
$$x = 4 \quad \text{or} \quad x = -14$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 16x + 39$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 8x) + 39$$

We want a perfect square. Halve -8 and square the result to get 16 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 8x + 16 - 16) + 39$$

Factor the perfect-square trinomial.

$$y = 2((x-4)^2 - 16) + 39$$

Distribute the 2.

$$y = 2(x-4)^2 - 32 + 39$$

Combine the constants to get **vertex form**:

$$y = 2(x-4)^2 + 7$$

The vertex is at point $(4, 7)$.